

**REMARKS**

Claims 21, 23, 26, and 28-31 are pending in the current application, with claims 22 and 24 being cancelled. Claims 21, 23, 26, and 28-31 currently stand rejected, and claims 21, 29, and 31 amended. Reconsideration and withdrawal of the current rejections are respectfully requested in light of the preceding amendments and following remarks.

**Claim Rejections – 35 U.S.C. 103**

Claims 21-26 and 28-32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over US Pat 6,735,267 to Orii et al. ("Orii") in view of US Pat 5,068,082 to Ueda et al. ("Ueda") and US Pat 5,229,068 to Johansson et al. ("Johansson"). Applicants respectfully traverse this rejection for the reasons detailed below.

Initially, Applicants note that each independent claim has been amended to recite the subject matter of cancelled claims 22 and 24, *viz.*, lengths of short- and intermediate-length fuel rods. Thus, the Examiner's rejections to cancelled claims 22 and 24 are addressed in connection with the independent claims as amended.

With regard to claim 21, the Examiner alleges that Orii teaches each and every element of that claim, with the exception of "a first part-length rod group" and a "second part-length rod group" having different lengths. The Examiner applies Ueda to teach rod groups having different lengths, and further states that the recited lengths of "about 0.1 to about 0.4 of the full-length rods" for

the first group and “about 0.6 to about 0.9 of the full-length rods” for the second group is a matter of “optimization within prior art conditions.” Office Action mailed Feb. 13, 2006 at 4-5.

Applicants respectfully submit that a short-length rod group having a length of “about 0.1 to about 0.4 of the full length rods” is not taught by any of Orie, Ueda, or Johansson. Rather, each of these references disclose part-length rods having a minimum length of 0.46. See Orie, Equation 4; Col. 13, ll. 5-9 (length of  $11/24$  or greater of full length rod); Ueda, Col. 14, ll. 51-66; Fig. 25A (length of  $1/2$  of full length rod); Johansson, FIGS. 3A-3F (length of about  $5/9$  of full length rod). Because the recited length ranges are not found in any of the applied references, it cannot be a matter of optimization to find the recited ranges “within prior art conditions.”

Further, the modification of Orie to meet the missing recited ranges is impermissible under § 103(a), because Orie teaches away from the recited ranges, and none of the secondary references cure this teaching away. Particularly, Orie teaches that each of its embodiments meet the disclosed Equation 4 for part-length rod length, which requires that any part length rod be at least 45.83% of the length of the full length rods. See Orie, Equation 4, throughout the disclosure; FIGS. 7, 10, 13, and 16 (all showing permissible range ending at  $11/24$  length ratio). Critically, Orie states:

“When the effective fuel length of the short length fuel rod 2B is made shorter than  $11/24$  as described above, the uranium inventory becomes too small to deteriorate the fuel cycle cost. Therefore, the value  $L_p/L_f$  must be larger than  $11/24$  (Equation 4).”

Orii, Col. 8, ll. 2-6 (emphasis added). This clearly teaches away from the recited ranges under about 0.4.

Ueda and Johansson do not cure this teaching away. As discussed above, none of these references depart from the length limitations of Orii into the recited short-length rod range. Further, none of Ueda and Johansson correct Orii's teaching away by suggesting satisfactory uranium inventories in the recited length ranges. Thus, it is improper to modify the disclosed ranges of the applied references to meet the recited ranges under § 103(a). See KSR Int'l Co. v. Teleflex, Inc., 550 U.S. \_\_\_, slip. op. 04-1350 at 12 (2007) ("when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious."); see also MPEP §§ 2141, 2143.

Because Orii, alone or in combination with Ueda and Johansson, fails to teach each and every element of claim 21 and cannot be modified to do so, these references cannot anticipate or render obvious claim 21. Claims 29 and 31 recite a similar unique feature as claim 21 and are thus equally allowable over the applied references. Claims 23, 26, 28, and 30 are allowable at least for depending from an allowable base claim. Withdrawal of the rejection under 35 U.S.C. § 103(a) to claims 21, 23, 26, and 28-31 is respectfully requested.

**CONCLUSION**

Accordingly, in view of the above amendments and remarks, reconsideration of the objections and rejections and allowance of each of claims 21, 23, 26, and 28-31 in connection with the present application is earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Gary D. Yacura at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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